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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/692,610	10/24/2003	Izhak Baharav	10991144-5	8820

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EXAMINER	
HESS, DANIEL A	

ART UNIT	PAPER NUMBER
2876	

DATE MAILED: 03/14/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/692,610	BAHARAV ET AL.	
	Examiner	Art Unit	
	Daniel A. Hess	2876	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *2/18/05 interview with Mr. Garcia*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *15-35* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *15-35* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☒ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Remarks

This action is in response to a telephonic interview with Mr. Garcia on 2/18/05. Prosecution is reopened, because the examiner changed the grounds of rejection inadvertently for at least claim 20. Also, since the applicant's arguments filed 1/18/2005 have been fully considered and they are somewhat persuasive, as the 'response to arguments section,' below, shows.

The examiner appreciates Mr. Garcia's carefully considered comments.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claim 15-17, 20, 21, 23-25 and 31-34 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tow (US 5,315,098), of record in applicant's information disclosure of 7/14/2004, and also in the first Office Action.

Re claim 15:

The first part of the claim,

> A method for generating a visually significant barcode comprising: receiving an M x N pixel image, wherein M and N are positive integers; receiving a message having a plurality of symbols ; partitioning at least a portion of the MXN pixel image into a plurality of KxK image matrices, wherein K is a positive integer; and converting at least one of the KxK image matrices to a respective KxK barcode matrix corresponding to a symbol in the message and contained in one of multiple predetermined barcode matrix sets

has some inherent aspects and needs to be looked at closely. The examiner observes that Tow must inherently be dividing an input image into square subsections (rectangular image matrices). Why? In performing a periodic sampling (column 3, line 31), in effect each sample is a measurement of a hypothetical region that contains that sample. *Imaginary dividing lines could be drawn going vertically and horizonally, equally spaced, going between the grayscale samples*. These imaginary dividing lines define input images. Why are the samples square? Because the halftone patterns which replace them are to be square (see figure 2) and if the samples were not square, distortion would result. These 'image sections' defined by the grayscale sampling are converted to KxK matrices encoded with the desired data (see especially figure 1 and figures 3a-3c).

What is not taught by Tow is that the subsections of the input image must have dimensions of KxK. This will be discussed below, after the second part of the claim is discussed.

The second part of the claim,

> selected based on pixel values in the KxK image matrix being converted, wherein each barcode matrix set includes a respective barcode matrix for each possible symbol in the message, and barcode matrices in different sets encoding a common message symbol have different respective spatial patterns of dots selected from a set of different colored dots.

is present: 'the sizes of these halftone dot patterns are modulated in accordance with the grayscale data sample values that are provided to define the image..." (column 3, lines 49-53). It is clear (see especially figure 2) that in changing the sizes of halftone patterns to account for variations in the tone of the image being converted, one must clearly adjust the dot pattern. In figure 2, which is a 5x5 array of pixels (column 3, line 51), six pixels are 'on.' To darken this KxK matrix, one increases the size of the halftone pattern, clearly by adding pixels to it. This will indeed change the spatial pattern of dots, as recited in claim 1. As for the use of different colored dots, it is clear (column 1, lines 19-20) that the instant invention is applicable to dual tone color separations. Thus for example, darkening can create a completely new set of matrices, similar to the set shown in figure 3, but with one or more additional pixels activated.

As discussed above, what is not taught by Tow is that the subsections of the input image have to have dimensions of KxK.

However, the halftone patterns which are to be created are KxK; therefore if the encoded image is to be the same size as the initial image, the halftone patterns would have to be the same size as the above-described regions that they replace.

There are several motives to maintain image size: (a) maintain layout on a page where images and text or several images may be present, (b) ensure that an image will fit on a page just as it did when it was scanned, and (c) avoid adversely affecting the appearance through size distortion.

Re claims 16 and 35: A color level image has been discussed above; grayscale (column 2, lines 49-51) are also possible.

Re claim 17: Grayscale (column 2, lines 49-51) normally has greater than two different tones spanning the range of white to black.

Re claim 20: Decoding is referred to by Tow but the steps are not given and must be inferred.

Tow's references to decoding include: the title; also, the very field of the invention is described as "embedding machine readable digital data" (column 1, lines 5-10) and further, the phrase machine readable is referenced throughout, in addition to discussion of scanning input in the process of "recovering this machine readable data" (column 1, lines 55-68).

Nevertheless steps described in claim 20 are each necessary (or an approximation of the steps is necessary) to decode the encoded image described in Tow. The first step, "partitioning into a plurality of sub-images" must take place: individual cells must be recognized in order to retrieve the data stored within them. The second step, "comparing each sub-image with a set of L possible barcode matrices [cells]" is also necessary: every cell which is evaluated in the decode process must be determined to be one of the number of possible cell types, each having a different orientation. The third step, "decoding a message based on a match estimation of each sub-image to each one of the possible L possible barcode matrices" is necessary as well: the term 'message' can be any set of data that was encoded; the cells which are each evaluated to determine one of L possible states together form a data set which we may call a message.

These are the most obvious steps, since they are simply the reverse of the encoding process shown in figures 1 and 3. The examiner believes that they are inherent as well.

Re claim 21: Locating each individual halftone image is clearly a necessary step before machine-deciphering it.

Re claim 23: Although not explicitly stated, Tow makes clear that by adjusting the tone, one can create additional sets ('groups') by changing the tone of the matrix, which will involve adding or subtracting activated pixels within the matrix and reproducing the various rotations. See the final paragraph of the discussion re claim 15, above.

Re claim 24: See column 2, lines 49-51.

Re claim 25: This mapping has been well illustrated in figures 1 and 3, as well as throughout Tow.

Re claim 31: Bright and dark pixels are evident in figure 3.

Re claim 32: Multi-tones are evident in figure 3.

Re claim 33: Images may at the pixel level be black and white (column 1, line 18).

Re claim 34: See figures 2 and 3: Each dot is a square pixel area.

Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tow in view of Curry (of record in prior action).

Tow fails to explicitly recite cluster dithering.

Curry shows (see figure 4) cluster dithering in a halftoning application; one would have been motivated to do this to convincingly reproduce the original image.

Claims 18, 22, 27, 28, 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tow as applied to claims 15 and 20 respectively, above, in view of Rhoads (US 6,345,104).

Re claims 18, 22, 27: Tow fails to teach or suggest the use of one or more fiducial marks to aid the proper machine decoding of the message embedded in the image.

Rhoads teaches (figures 7a and 7b; column 7, line 19 to column 8, line 26) the use of calibration tiles intermixed with tiles containing data an overall watermark to enable calibration for a more-precise and less error-prone read.

In view of Rhoads' teaching, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the calibration cells (i.e. fiducial marks) of Rhoads in the teachings of Tow to achieve a decode that is more accurate by having 'test data' for calibration prior to decoding the real message.

Re claim 28: Corner areas would be an obvious choice for a fiducial mark; legends on maps are typically in a corner.

Re claim 29: For a mark to be detectable against a background, there must be sufficient contrast between it and its background.

Claims 26, 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tow as applied to claims 25 above, in view of the applicant's own prior art admission.

Re claim 26: In particular, the applicant recites in his own specification, the following (instant specification, page 14, lines 18-20): In addition, the visually significant bar code system of the present invention can employ various error correcting codes, **which are generally well known to those of ordinary skill in the art**, for reliable automated retrieval of bar codes. The

examiner concurs that things such as 'checksums' have long been used to ensure accurate data encoding and decoding.

Re claim 30: It is often the case the when data is placed in a region where space is limited that the data is compressed. Examples include compression of data into .zip files for conveyance on the Internet and .jpeg files for lower size storage. The motivation in such cases is to get more data into a limited area; Tow's system can certainly carry only a limited amount of data (equal to the number of KxK matrices).

Response to Arguments

Applicant's arguments filed 1/18/2005 have been fully considered and are partially persuasive, convincing the examiner that certain elements of claim 15 may not be fully taught. In the examiner's view, however, that which is not fully taught is nevertheless obvious, with respect to claim 15. The applicant notes, "Tow does not divide an input image into KxK matrices. Instead, Tow's halftoning system operates on 'spatially periodic grayscale input image sample values' (column 3, lines 31)."

The examiner observes that Tow must inherently be dividing an input image into square subsections (rectangular image matrices). Why? In performing a periodic sampling, in effect each sample is a measurement of a hypothetical region that contains that sample. *Imaginary dividing lines could be drawn going vertically and horizonally, equally spaced, going between the grayscale samples*. These imaginary dividing lines define input images. Why are the

samples square? Because the halftone patterns which replace them are to be square (see figure 2) and if the samples were not square, distortion would result.

What is not taught by Tow is that the subsections of the input image have to have dimensions of KxK.

However, the halftone patterns which are to be created are KxK; therefore if the encoded image is to be the same size as the initial image, the halftone patterns would have to be the same size as the above-described regions that they replace.

There are several motives to maintain image size: (a) maintain layout on a page where images and text or several images may be present, (b) ensure that an image will fit on a page just as it did when it was scanned, and (c) avoid adversely affecting the appearance through size distortion.

The examiner suspects that Tow *does* maintain image size and thus is effectively taking KxK image sections and encoding them. However, since this is not explicitly recited, a 103 rejection is made herein.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Daniel A. Hess whose telephone number is (571) 272-2392. The examiner can normally be reached on 8:00 AM - 5:00 PM M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael G. Lee can be reached on (571) 272-2398. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

DH

DANIEL STCYR
PRIMARY EXAMINER